REMARKS

Introduction

Claims 46-53 and 63 remain pending in the present application. In this Supplemental Response, independent claim 46 has been amended and new dependent claim 63 has been added.

Initially, Applicants would like to thank the Examiner for the interview conducted on November 22, 2010 which was summarized by the Examiner in the Interview Summary dated November 30, 2010. As summarized in the Interview Summary, that if "claim 46 were to be amended to recite "in this order" after "comprising" in line 1, the examiner agrees that the claims would be limited to a device in which the electron transporting layer is separate from the light emitting layer". It should be noted that claim 46 has been amended to recite "in this order" after "comprising in line 1. Applicants, however, disagree with the Examiner's statement in the Interview Summary that "the original disclosure does not support a claim to a device in which the compound of formula 1 is in an electron transporting layer that is separate from the light emitting layer". Please refer to the discussion hereinbelow regarding the foregoing. The Interview Summary further indicates that the art rejections of record can be overcome "by deleting "phenyl, biphenyl" from the first two lines after the last formula in claim 46". In view of the foregoing, new dependent claim 63 has been added consistent with the foregoing. Finally, as indicated in the Interview Summary, an agreement with respect to the claims was not reached during the interview.

Applicants respectfully request the Examiner to reconsider and withdraw the outstanding rejections in view of the foregoing amendments, the following remarks, and remarks previously submitted on November 11, 2010.

Rejections under 35 U.S.C. § 103

Claims 46-53 have been rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 5,077,142 (hereinafter "Sakon") in view of *Schomaker et al.*, J. Org. Chem., Vol. 66, pp. 7125-7128 (2001) (hereinafter "Schomaker"). Claims 46-53 have been rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Sakon in view of Schomaker as applied to claims 46-53 and further in view of U.S. Patent No. 6,352,791 (hereinafter "Fink"). These rejections are respectfully traversed.

Legal Standard

It should be noted that the Office has the initial burden of establishing a factual basis to support the legal conclusion of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). For rejections under 35 U.S.C. § 103(a) based upon a combination of prior art elements, in *KSR Int'l v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007), the Supreme Court stated that a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). Moreover, all words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Pending Claims

Independent claim 46 from which rejected dependent claims 47-53 directly or indirectly depend, recites, *inter alia*, an electroluminescent device comprising in this order: a) an anode b) a hole injecting layer and/or hole transporting layer c) a light emitting layer d) an electron transporting layer and e) a cathode, wherein b), c), and d) are organic compound layers, and wherein said organic compound layers comprise an organic compound of formula I.

Cited Art

Sakon is directed to an electroluminescent device for converting an energy of an electric field applied directly to a light energy and capable of producing surface luminescent for a large area different from conventional incandescent lamps, fluorescent lamps or light emitting diodes. (Abstract).

Schomaker discusses arylation of halogenated pyrimidines via a Suzuki Coupling reaction. (Abstract).

Fink is related to an electroluminescent arrangement made up of at least two electrodes and a light-emitting layer system comprising at least one electron-conducting layer, the electron-conducting layer containing at least one compound having a triazine basic member. (Abstract).

Differences between Pending Claims and Cited Art

It is respectfully submitted that the cited art fails to disclose or suggest an electroluminescent device comprising in this order: a) an anode b) a hole injecting layer and/or hole transporting layer c) a light emitting layer d) an electron transporting layer and e) a cathode, wherein b), c), and d) are organic compound layers, and wherein said organic compound layers comprise an organic compound of formula I, as presently recited in independent claim 46.

Further, as already noted in the Response submitted on November 11, 2010, the Examiner has maintained her position in this Office Action primarily because "[w]hile independent claim 46 sets forth various functional layers that the claimed device comprises, the specification teaches that a single layer may provide the function of several layers (e.g. see page 35, lines 5-11)" and because "[t]he specification also teaches that the compounds of the present invention function as light emitters that can also injection/transport holes and inject/transport electrons (p. 35, l. 20-26)", "[t]he referenced portion of the specification supports a claim interpretation of a device in which light emitting layer c) also functions as electron transporting layer d)" and that "the specification does not explicitly describe a device in which a compound of formula I is used in an electron transporting layer that is distinct from the light emitting layer". (Office Action dated August 11, 2010, Pages 6-7).

In response to the Examiner's position, the following points should be noted:

(i) Independent claim 46 recites, *inter alia*, an electroluminescent device comprising in this order: a) an anode b) a hole injecting layer and/or hole transporting layer c) a light emitting layer d) an electron transporting layer and e) a cathode, wherein b), c), and d) are organic compound layers, and wherein said organic compound layers comprise an organic compound of formula I. The presently recited organic compounds are pyrimidine compounds.

(ii) Exemplary support for independent claim 46 can be found at least at page 35, lines 13-18, which discloses that a "preferred EL device comprises in this order: (a) an anode, (b) a hole injecting layer and/or a hole transporting layer, (c) a light-emitting layer, (d) optionally an electron transporting layer and (e) a cathode"; at page 35, lines 23-26 which provides that "the light emitting compounds of this invention are excellent … the transportation of electrons"; at page 35, line 29, which provides that the "organic compounds of the present invention form uniform thin films"; and at page 4, line 16 through page 5, line

9, which provides in relevant part "...an electroluminescent device comprising an anode, a cathode and one or a plurality of organic compound layers sandwiched therebetween, in which said organic compound layers comprise an organic compound containing one or more pyrimidine moieties...". Thus, the presently pending claims are clearly and fully supported by the present specification.

(iii) While the present specification does provide at page 35, lines 5-11 that "organic EL devices contain one or more layers...[t]his structure is a general case and may have additional layers or may be simplified by omitting layers so that one layer performs a plurality of tasks", the foregoing disclosure pertains to an embodiment described in the present specification. However, according to another embodiment in the present specification, the disclosure summarized in item (ii) hereinabove is provided.

(iv) In light of at least (i)-(iii) above, contrary to the Examiner's position, it has clearly been established that the specification does in fact explicitly describe a device in which a compound of formula I is used in an electron transporting layer that is distinct from the light emitting layer.

(v) In support of (iv) above, it should be noted that M.P.E.P. § 2163 provides that *ipsis verbis* (*i.e.*, in the same words) support of the claims in the specification is not required. As it is not necessary to have the presently recited claims supported in the specification using the "same words", the exemplary support for claim 46 summarized in item (ii) is sufficient.

Further in support of (iv) above, it should be noted that "[t]hough understanding the claim language may be aided by explanations contained in the written description, it is important not to import into a claim limitations that are not part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment." *Superguide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875, 69 USPQ2d 1865, 1868 (Fed. Cir. 2004). Accordingly, it is inappropriate for the Examiner to take the position that the "referenced portion of the specification supports a claim interpretation of a device in which light emitting layer c) also functions as electron transporting layer d)". (Office Action dated August 11, 2010, Page 7).

As already noted in the Response submitted on November 11, 2010, with regard to Sakon, it is respectfully submitted that Sakon generically discloses hundreds of organic compounds for use in its electroluminescent device. The Examiner appears to rely to Sakon's disclosure of compounds 9, 10, 146, and 148 to reject the present claims. It is respectfully

submitted that none of the compounds, let alone compounds 9, 10, 146, and 148, disclosed in Sakon are the same as the presently recited pyrimidine compounds. In fact, the Examiner appears to concede the foregoing and thus takes the position that "[t]here are only three possible substitution patterns for such a substituted pyrimidine, and one of ordinary skill in the art at the time of the invention would have reasonably expected that a 2,4,6-Ar-substituted pyrimidine would be light-emissive and could be used for Sakon's purposes". (Office Action dated August 11, 2010, Page 4).

As further previously submitted in the Response submitted on November 11, 2010, Applicants respectfully submit that one of ordinary skill in the art would not randomly substitute Sakon's compounds to create the presently recited compounds unless this is accomplished using impermissible hindsight. In this regard, it is respectfully submitted that M.P.E.P. § 2142 sets forth that impermissible hindsight must be avoided. Moreover, it is respectfully submitted that due to the lack of any guidance in Sakon pertaining to arriving at the presently recited pyrimidine compounds, it would have been impossible to create compounds with predictable properties that would direct one of ordinary skill in the art to make the presently recited pyrimidines from the hundreds of compounds generally disclosed in Sakon.

As already noted in the Response submitted on November 11, 2010, while it is not clearly articulated in the rejection detailed at pages 2-4 of the Action, it appears that the Examiner relies upon Schomaker as the secondary reference to support the rejection based primarily on Sakon. With regard to Schomaker, it is respectfully submitted that while Schomaker discusses preparation of monophenyl-, diphenyl- or triphenyl-pyrimidine compounds (Abstract), there is no reason one of ordinary skill in the art would turn to Schomaker after reading Sakon to specifically obtain the presently recited pyrimidines unless impermissible hindsight were relied upon. Moreover, it should be noted that Schomaker is not related to the field of electroluminescent devices. Thus, there clearly is no reason one of ordinary skill in the art would look to the teachings of Schomaker after reading Sakon.

As further previously submitted in the Response submitted on November 11, 2010, with regard to Fink, it is respectfully submitted that while Fink teaches triazine compounds, Fink, either alone or in combination with Sakon does not disclose or suggest the presently recited pyrimidine compounds. Again, the Examiner appears to take the position that "it would have been an obvious modification to one of ordinary skill in the art at the time of the

invention to make compounds similar to those of Sakon's general formula having pyrimidine for B'…" (Office Action dated August 11, 2010, Page 6). It is again respectfully submitted that one of ordinary skill in the art would not randomly substitute Fink's compounds to create the presently recited compounds unless impermissible hindsight (which must be avoided) is relied upon. Moreover, it is respectfully submitted that due to the lack of any guidance in any of the cited references pertaining to arriving at the presently recited pyrimidine compounds, it would have been impossible to create compounds with predictable properties that would direct one of ordinary skill in the art to make the presently recited pyrimidines from the hundreds of compounds generally disclosed in the cited references.

As already noted in the Response submitted on November 11, 2010, as provided in the Declaration submitted on March 9, 2009, when used as an electron transport layer, the pyrimidine compounds of the instant invention yield higher luminous efficiency when compared to analogous triazine compounds. As further provided in the Declaration, this is most striking when measured as C.Eff, but is also seen when measured as P.Eff except for the comparison of PYM 2 with TZ 2 in the red device where the values are the same. The Declaration also provides that the differences seen demonstrate a significant improvement for the pyrimidine compounds despite the fact that the pyrimidines and triazines both have very similar low lying HOMO values typical for electron transporting materials. As provided in the Declaration, for example, HOMO (highest occupied molecular orbital) values calculated from CV measurements in solution using Fc/Fc+ as an internal standard revealed a value of -5.6 eV for each of PYM 2 and TZ 2. The Declaration goes on to provide that it appears that the pyrimidine has a much lower lying LUMO (lowest unoccupied molecular orbital) which may be responsible for the improvement. As further provided in the Declaration, in any case, given the structural similarities between the pyrimidine and triazine core and the similarities in the low lying HOMO levels, considered a significant factor in electron transport, the differences observed and reported in the above tables are unexpected as well as significant.

As further previously submitted in the Response submitted on November 11, 2010, Applicants respectfully point out that the data in the Declaration submitted on March 9, 2009 clearly and specifically shows that triazines and pyrimidines demonstrate significantly different efficiencies in EL devices. It is, therefore, respectfully submitted that one cannot sufficiently rely on the triazines of the cited art to suggest the presently recited pyrimidines when the presently recited pyrimidines are shown to be surprisingly more efficient.

It is thus respectfully submitted that Sakon, Schomaker, and Fink, either alone or in combination, fail to disclose or suggest *all* presently recited features in independent claim 46.

As already noted in the Response submitted on November 11, 2010, it is further respectfully submitted that the Examiner seems to be improperly picking and choosing various features of each of the cited references in hindsight to obtain the presently recited compositions. In this regard, it should be noted that M.P.E.P. § 2142 sets forth that impermissible hindsight must be avoided.

Accordingly, in light of at least the above discussion, it is respectfully submitted that a *prima facie* case of obviousness has not been established against the pending claims based on the cited art.

As further previously submitted in the Response submitted on November 11, 2010, if the Examiner maintains her position that the cited art somehow discloses each and every feature presently recited, the Examiner's attention is directed to M.P.E.P. § 2142, which provides that the key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007) (emphasis added). More particularly, in an effort to clarify the record, clarification is requested regarding whether the Examiner is taking the position that the cited references are somehow automatically combinable and/or somehow inherently disclose each and every feature presently recited. Even if it were assumed *arguendo* that a *prima facie* case of obviousness has been established in view of the cited art, a *prima facie* case of obviousness can be rebutted by a showing of unexpected results. (See, for example, *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963)). In this regard, it is respectfully submitted that, as discussed hereinabove, the data in the Declaration submitted on March 9, 2009 clearly and specifically shows that triazines and pyrimidines demonstrate significantly different efficiencies in EL devices. It is, therefore, respectfully submitted that one cannot sufficiently rely on the triazines of the cited art to suggest the presently recited pyrimidines when the presently recited pyrimidines are shown to be surprisingly more efficient.

In view of at least the above, the obviousness rejections should be withdrawn.

Conclusion

The Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below if any issues remain in this matter, or if a discussion regarding any portion of the application is desired by the Examiner.

Respectfully submitted,

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